UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,662	11/09/2006	Ki-Baek Han	5952-064	8632

24112 7590 11/19/2008

COATS & BENNETT, PLLC
1400 Crescent Green, Suite 300
Cary, NC 27518

EXAMINER	
ANDERSON, DENISE R	

ART UNIT	PAPER NUMBER
1797	

MAIL DATE	DELIVERY MODE
11/19/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/598,662	HAN ET AL.	
	Examiner	Art Unit	
	Denise R. Anderson	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Specification

2. The claims and specification were amended. Previous objections to the specification are withdrawn since antecedent basis is now provided for:

a. Air supply holes recited in claims 29, 37, 44, and 45.

b. Treatment cavity recited in claim 41.

c. Media fixing plate recited in claim 45.

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

a. Member with air supply holes – Claims 29 and 37. In the patentability analysis, the examiner will assume this is the media fixing plate 12 with air supply holes 14 recited in the specification and shown in Figure 6-7.

b. Annular device – Claim 43. In the patentability analysis, the examiner will assume this is the density control plate 9 recited in the specification and shown in Figures 2 and 10.

c. Array of openings in a circumferential band – Claims 31 and 46. In the patentability analysis, the examiner will assume these are the supplied water

passing holes 8 in the elongated housing forming main body 1 recited in the specification and shown in Figures 2 and 9.

d. Annular plate -- Claim 52. In the patentability analysis, the examiner will assume this is the density control plate 9 recited in the specification and shown in Figures 2 and 10.

Claim Rejections - 35 USC § 102
Fine Filtering Apparatus Recited In Claims 25-33

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 25-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Boye (WO 02/24306 A1, Mar. 28, 2002).

6. The patentability analysis will begin with claim 25 limitations. In Figures 1-4, Boye discloses "a device and a method for filtering a fluid." Boye, p. 1, line 5. As shown in Figure 1, Boye teaches an elongated housing (holding member 9) with flexible fibers (fibers 2) that "may be solid or hollow." Boye, p. 7, line 7. The Boye housing in Figure 1 has a first end portion (inlet end 5) and a second end portion (outlet end 3). Boye further discloses that the first end portion has a water inlet (Figure 2, fluid inlet pipe 48) and an annular water guide jacket that surrounds the inlets 6 shown in Figure 1. About the inlets 6, Boye also teaches, "A number of inlets 6 are arranged in the side-wall of the fibre housing 1 near the inlet end 5." Boye, p. 10, lines 32-33. Boye also

discloses a header jacket (Figure 1, shown by the arrow exiting the device) that includes a waste outlet (Figure 2, through valve 62 connected to pipe 61 leading to deposit container 60) and a clarified water outlet (Figure 2, through valve 65 connected to pipe 64 leading to filtered fluid container 70). The Boye device also has an air inlet (Figure 2, inlet 66) that "may be used for injecting or conducting a liquid, air or a gas into the system to be used for a flushing process." Boye, p. 14, lines 20-21.

7. Regarding the newly recited density control plate, Boye discloses three density control plates (Figure 1, first and second inner collars 11 and 12, and compressing means 7a and 7b) that are within housing (Figure 1, holding member 9) above water jacket guide (Figure 1, water jacket guide surrounds inlets 6). Boye further teaches, "[T]he principles of having a fluid filtration wherein a plurality of fibres extend longitudinally in the direction of the fluid flow, and wherein the quality of the filtration is controlled by adjusting the compression and thereby the density of the fibres is known." Boye, p. 2, lines 10-13. In a discussion of "the distance from the inlet end of the fibre housing to said location of compression," Boye discloses that "[d]ifferent arrangements of said location of compressing may be used" with the preferred distance being 25% to 60% "the total length of the fibre housing." Boye, p. 4, lines 15-22. Boye also teaches that the water jacket has to be near inlet 5, but not at inlet 5, when Boye states, "A number of inlets 6 are arranged in the side-wall of the fibre housing near the inlet end 5." Boye, p. 2, lines 10-13 and p. 10, lines 32-33. To recap, then, Boye discloses multiple density control plates along the length of the housing, one of which can be below water jacket guide, "according to the principles of fluid filtration" to "adjust (in

applicant's case, increase) the compression and thereby the density of fibers." Boye, p. 2, lines 10-13.

8. Regarding the recited filtering and cleaning modes, Boye discloses the two modes in Figure 2 and in the statement, "[A] major advantage of a filtering device according to the present invention is the possibility of flushing the fibres when the pressure on the fibres is released. The flushing process may be either a forward or a backward flushing process. This is illustrated in Fig. 2." Boye, p. 14, line 24 and p. 13, lines 25-28.

9. In summary, Boye anticipates claim 25.

10. Regarding dependent claims 26-28, Boye discloses that the fibers are attached to a media fixing plate near the inlet and the fibers are free to move near the outlet [claim 26] with the statement, "When arranging the fibres in the fibre housing it is preferred that the fibres at the inlet end of the fibre housing are attached to an end part of the fibre housing. . . In a preferred embodiment, the fibres have free fibre ends at the opposite end of the inlet end of the fibre housing." Boye, p. 7, lines 19-20 and 23-24. Boye also anticipates claims 27 when Boye teaches, "[T]he fibers may be solid or hollow" and, "In a preferred embodiment the fibres comprise polyester or nylon fibres." Boye, p. 7, lines 7-9. The Boye fibers extend through an opening in each of the three density control plates [claim 28]. Boye, Figure 1, fibres 2 extend through an opening in first inner collar 11, second inner collar 12, and compressing means 7a and 7b.

11. Regarding dependent claims 29-31, Boye discloses an array air supply holes within the media fixing plate [claims 29 and 30] in Figure 3, where, "[T]he liquid or fluid may pass from the inlet(s) through the mounting 310, along the fibre-head 309 (applicant's media fixing plate), and then enter into the bundle of fibres along the outer side of the bundle 302." Boye, p. 17, lines 30-32. Boye further teaches, "In Fig. 2 is also shown an inlet 66 . . . The inlet 66 may be used for injecting or conducting a liquid, air or a gas into the system to be used for a flushing process." Boye, p. 14, lines 18 and 20-21. In Figure 1, Boye also discloses openings in the water guide jacket [claim 31] in the form of inlets 6.

12. In summary, Boye anticipates all limitations recited in dependent claims 26-31.

Claim Rejections - 35 USC § 103
Fine Filtering Apparatus Recited In Claims 25-33

13. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boye (WO 02/24306 A1, Mar. 28, 2002) as applied to claim 25 above, and further in view of Ford et al. (US Patent No. 4,793,932, Dec. 27, 1988).

14. Boye discloses the claimed invention except for explicitly stating that the fibers are polypropylene. Ford et al. teaches polypropylene fibers as the preferred embodiment in the context of a "Variable Volume Filter or Concentrator" used "for concentrating the fine solids of a liquid feed suspension" shown in Figure 1. Ford et al., Title; Abstract, lines 1-3; Figure 1; Column 4, lines 35-45. It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Boye device, to have made the flexible fibers of polypropylene, as taught by Ford et al. since

Ford et al. states, in the title and in the abstract, lines 1-3, that such modification was a preferred polymeric fiber in a "Variable Volume Filter or Concentrator" used "for concentrating the fine solids of a liquid feed."

15. In summary, Boye, in view of Ford et al., discloses or suggests all claim 27 limitations.

16. Claims 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boye (WO 02/24306 A1, Mar. 28, 2002) as applied to claim 25 above, and further in view of Barzuza et al. (US Patent No. 4,617,120, Oct. 14, 1986).

17. Boye discloses the claimed invention except for the porous chamber. Barzuza et al. teaches that it is known in the water filtration art to place a skirt of solid flexible fibers (fibers 6) around a porous chamber (filter tube 2 having perforations 4). Barzuza et al., Column 1, lines 9-14; Figures 1 and 20-23; Column 3, lines 1-4. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included the porous chamber in the Boye apparatus as taught by Barzuza et al., since Barzuza et al. states at Column 1, lines 43-46 that such a modification would "provide a fluid filtering device that is self-cleaning by a flushing process and is both reliable and inexpensive."

18. Claim 33 recites a porous chamber that fills 10% to 50% of the cavity volume. It would have been obvious to one having ordinary skill in the art at the time the invention was made, in the Boye apparatus, to have made the porous chamber 10% to 50% of the cavity volume, since it has been held that where the general conditions of a claim

are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

19. In summary, Boye, in view of Barzuza et al., discloses or suggests all limitations recited in claims 32-33.

Claim Rejections - 35 USC § 102
Fine Filtering Apparatus Recited In Claims 34-40 and 53

20. Claims 34-40 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Boye (WO 02/24306 A1, Mar. 28, 2002).

21. Independent claim 34 is analogous to independent claim 25 but (1) substitutes claim 25's "annular water guide jacket" for "first end portion of the housing," (2) substitutes claim 25's "header jacket" for "second end portion of the housing" and (3) includes claim 28 limitations into the newly recited density control plate. As such, the patentability analyses are similar and will not be repeated here.

22. Likewise, claims 35-40 are analogous to claims 26 and 28-32, respectively. Some wording differences exist. For example, the term "annular water guide jacket" returns in claim 39 instead of appearing as in independent claim 34. Also, the wording differences have led to a lack of antecedent basis and the specification was objected to above when this occurs. Still, the patentability analyses are similar and will not be repeated here.

23. Claim 53 recites solid fibers and, as was shown in the claim 25 patentability analysis above, Boye discloses flexible fibers (Figure 2, fibres 2) that "may be solid or hollow." Boye, p. 7, line 7.

24. In summary, Boye anticipates all limitations recited in claims 34-40 and 53.

Claim Rejections - 35 USC § 103
Method to Use Fine Filtering Apparatus Recited In Claims 41-52

25. Claims 41-52 are methods claims that describe filtration and cleaning with air on the treatment side, using the above filtering apparatus. In the above patentability analysis, the filtration apparatus claims 25-31, 34-40, and 53 were rejected under 35 U.S.C. 102(b) as being unpatentable over Boye and filtration apparatus claims 32-33 were rejected under 35 U.S.C. 103(a) over Boye in view of Barzuza et al.. In the patentability analysis below, the method claims are also found to be unpatentable over the same references.

26. Specifically, method claims 41-47 and 49-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Boye (WO 02/24306 A1, Mar. 28, 2002).

27. Method claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boye (WO 02/24306 A1, Mar. 28, 2002), and further in view of Barzuza et al. (US Patent No. 4,617,120, Oct. 14, 1986).

28. To paraphrase independent claim 41, applicant is claiming a method to use the above filtration apparatus to filter raw water and to clean the fibers with both raw water and air introduced on the raw water side. Applicant's filtration apparatus has a housing with flexible fibers inside. The flexible fibers are solid, not porous. At the first end of the body is a water inlet and an air inlet. At the second end of the body is a clarified water

outlet and a waste outlet. The described apparatus was already found unpatentable in the claim 25 patentability analysis above.

29. Applicant uses the filtration apparatus as follows:

(1) Close the waste outlet line and open the clarified water outlet line.

(2) Feed raw water through the water inlet into the housing.

(3) Discharge the clarified water from the clarified water outlet.

(4) Close the clarified water discharge line and open the waste outlet line.

(5) Inject air into the housing to form an air-water mixture.

(6) Let the air-water mixture pass through the housing to clean the flexible fibers.

(7) Discharge concentrated waste through the waste outlet line.

30. Boye discloses the claimed apparatus as recited in claims 25 and 34. Boye further teaches the claimed method in Figure 2, beginning with all valves closed.

(1) Close the waste outlet line (valve 62) and open the clarified water outlet line (valve 65).

(2) Feed raw water (open valve 69 and turn pump 52 on) through the water inlet (open valve 55) into the housing (filtering device 41).

(3) Discharge the clarified water (through pipe 64 to filtered fluid container 70) from the clarified water outlet (from open valve 65).

(4) Close the clarified water discharge line (valve 65) and open the waste outlet line (valve 62).

(5) Inject air (air inlet 66 through open valves 67 and 57) into the housing (filtering device 41) to form an air-water mixture.

(6) Let the air-water mixture pass through the housing (filtering device 41) to clean the flexible fibers.

(7) Discharge concentrated waste (through pipe 61 to deposit container 60) through the waste outlet line (valve 62).

31. In summary, Boye anticipates claim 41.

32. Dependent claims 42-47 and 49 recite various apparatus limitations already discussed above in claims 26 and 28-32 and the analogous patentability analyses will not be repeated here. In summary, Boye anticipates claims 42-46 and 49. Boye, in view of Barzuza et al., discloses or suggests all claim 47 limitations.

33. Dependent claim 48 recites generating turbulence by contacting water with the fibers. Regarding Figure 3, Boye discloses, "It is preferred that a ring 314 for providing a turbulent liquid flow, such as for example during the flushing process, is arranged at the inner wall of the housing 301." Boye, p. 18, lines 7-9. In summary, Boye anticipates all claim 48 limitations.

34. New claim 50 recites discharging clarified water when the concentrated waste outlet is closes – or closing the clarified water outlet while the concentrated waste outlet is discharged. Boye discloses this in Figure 2. There, valve 65 is open to discharge clarified water to the filtered fluid container 70 through pipe 64 and, simultaneously, valve 62 is closed to close the concentrated waste outlet. Similarly, valve 65 is closed

to close the clarified water outlet and, simultaneously, valve 62 is open to discharge concentrated waste to the deposit container 60 through pipe 61. In summary, Boye anticipates all claim 50 limitations.

35. New claim 51 recites increasing the flexible fiber density to inhibit water flow between the water inlet and the air inlet. This was discussed in the claim 25 patentability analysis above, in paragraph 7. In summary, Boye anticipates all claim 51 limitations.

36. New claim 52 recites the opening in the density control plate through which the fibers are constrained, similar to claim 28. As with claim 28, Boye anticipates all claim 52 limitations.

37. Summarizing the method claims patentability results, Boye anticipates claims 41-47 and 49-52. Boye, in view of Barzuza et al., discloses or suggests all claim 48 limitations.

Response to Arguments

38. Applicant's arguments with respect to claims 25, 34, and 41 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

39. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

40. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Denise R. Anderson whose telephone number is (571)270-3166. The examiner can normally be reached on Monday through Thursday, from 8:00 am to 6:00 pm.

42. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter D. Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

43. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRA

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797